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NATIONAL WEATHER SERVICE INSTRUCTION 10-1606

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Operations and Services

Performance, NWSPD 10-16

SERVICE ASSESSMENT

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OPR: W/COO11 (D. Young) **Certified by:** W/COO1 (C. Woods)

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SUMMARY OF REVISIONS: This directive supersedes NWS Instruction 10-1606, "*Service Assessment*," dated October 3, 2014.

The following changes were made:

1. Entire instruction was edited and rewritten for clarity, internal consistency to reflect NWS Headquarters reorganization effective April 1, 2015, and legal correctness.
2. Section 1 (Introduction, Second paragraph): Added a discussion of after-action reviews.
3. Section 4 (After-Action Review): Added this entire section.
4. Section 5.3 (Approval Memorandum): Updated the service assessment team charter description.
5. Section 5.4 (Service Assessment Team Composition) Modified the allowable personnel to participate on service assessment teams to abide by FACA rules.
6. Section 5.5.1 (Team Leadership Selection Criteria): Explained that a team leader or co-team leader may be selected from outside of the NWS.
7. Section 5.6 (Other Team Members and Consultants): Changed from "It is preferable to have" a social scientist on every service assessment team to "The team will include a social science/behavioral science expert." Removed the inclusion of a public affairs officer and a facilitator from the OCWWS Performance and Evaluation Branch.
8. Section 6.1 (Pre-Service Assessment Activities): Added that Root Cause Analysis training will be available to all service assessment team members prior to on-site activities.
9. Section 6.1.2 (Logistics): Added that NWSHQ and Regional HQ administrative assistant support will be available, at times, to help the service assessment team make interview appointments with impacted NWS stakeholders.
10. Section 6.4 (Draft Report), Step 7: Added that the NWS may implement alternative solutions to resolve findings.

11. Section 7 (Regional Assessments): Expanded this section and divided it into two parts (i.e., Regional Headquarters Responsibilities for Regional Assessments, National Headquarters Responsibilities for Regional Assessments). Also, explained that the team membership/composition for local and regional assessments is determined locally and/or regionally. Local/regional team membership selection is not required to follow the rules stated in this directive for national teams.
12. Added that all service assessment recommendations will be vetted through the MDC in Section 8.1 (Formulation of Action Items from Recommendations). Included that certain recommendations will be submitted as action items into CaRDS.
13. Appendix A (AAR Interview Agenda Template): Added this appendix.
14. Appendix B (Performance Area and Performance Factors): Added this appendix.
15. Appendix C (AAR Summary Format Template): Added this template.
16. Appendix E (Service Assessment Timeline): Changed a few entries.
17. Appendix F (Service Assessment Report Format): Explained that the identification of performance deficiencies should not be attributed to specific individuals or position titles.

Signed	8/3/16
John D. Murphy, Chief Operating Officer	Date

Service Assessment

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1 Introduction

The National Weather Service (NWS) uses a variety of methods to assess its service after hazardous weather events. A national service assessment is an evaluation of NWS performance, in the form of a report, generated by a service assessment team with a completion goal of 180 days from the start of the assessment. A national service assessment follows a significant hydrometeorological, oceanographic, or geological event that results in warning(s) and/or other operational activities by the NWS. The report serves as an evaluative tool to: (a) identify and share best practices in operations and procedures; (b) identify and recommend service enhancements; and (c) identify and address service deficiencies. Regional service assessments are similar to national service assessments, but are conducted for hazardous events at a lower threshold and are intended to be completed in a shorter period of time.

Events, exercises, and drills for which a rapid and informal review of operations would be valuable, After-Action Reviews (AAR), are performed to determine what happened, what went well, and what can be improved. Information collected during AARs may be used by decision makers to determine whether a regional or national service assessment is needed.

2 Mission Connection

Service assessments/reviews, along with verification and evaluation, help determine the effectiveness of NWS information and services, including decision support services, to partners and the public. Using input from behavioral scientists, service assessments also evaluate the public's response to risk communication. Verification and evaluation are ongoing activities that lead to continuous improvement. The end goal is to provide better information for better decisions that save lives and protect property.

3 Post-Storm Data Acquisition Quick Response Team

When extreme events occur (e.g., greater than Enhanced Fujita Scale [EF] 3 tornado), a Post-Storm Data Acquisition **(**PSDA) report should be compiled. To gather the data necessary for accurate post-event analysis, the rapid deployment of a PSDA Quick Response Team (QRT) may be required. Guidelines and requirements for initiating PSDA QRT action are detailed in NWS Instruction 10-1604, Post-Storm Data Acquisition.

If an NWS national or regional service assessment team or an AAR is convened, the PSDA QRT will provide ground and aerial survey information as an aid in the storm intensity rating process, if applicable. The PSDA report may be attached to, or integrated into, the national service assessment report, regional service assessment report, or AAR report at the discretion of the team leader. It may be advantageous to include a PSDA QRT member on the national service assessment team, regional service assessment team, or the after-action review team to provide continuity and expertise.

4 After Action Review

4.1 Introduction

An AAR is a rapid and informal assessment of NWS operations and performance for events, exercises, and drills that is intended to provide pre-decisional information, evaluations, and views to NWS management. In its essence, an AAR is a professional discussion regarding an event, focused on performance standards, that enables NWS staff to discover for themselves what happened, why it happened, and how to sustain strengths and improve on weaknesses. The AAR provides offices and the regional headquarters a means to debrief events and quickly share that information with other field/regional offices. Early information collected during the AAR process may be used by NWS senior leadership in determining whether or not to initiate a regional or national service assessment.

4.2 Mission Connection

The AAR supplements the service assessment process, verification, and evaluation programs. As a supplement to the service assessment process, the AAR provides a structured method to critique the products and services provided during an event, to coordinate and share situational awareness, and to identify potential issues with systems, communications, or infrastructure. The AAR also provides a mechanism to conduct a rapid evaluation of an exercise or simulation.

External partners may be consulted during the AAR to provide feedback on the event—principally feedback relating to Impact-based Decision Support Services (IDSS). Many members of the Emergency Management community are familiar with this type of debriefing process through their participation in exercises and training conducted by the Federal Emergency Management Agency (FEMA).

4.3 Initiating an AAR

An AAR may be conducted at either the local office or regional level, including under the following situations:

a. At the request of the NWS Director in place of, or to support, a regional service assessment and a national service assessment
b. At the request of regional senior leadership
c. When determined useful by an individual office’s management

The determination to conduct an AAR for real events is largely subjective. However, consideration should be given to conducting an AAR for scenarios that meet one or more of the following criteria:

a. After exercises, simulations, or drills (usually limited to internal NWS participants only to rapidly assess agency participation)
b. Following the provision of on-scene, IDSS to a core partner
c. When negative feedback is received from core partners regarding NWS products or services

d. When internal concerns are expressed regarding products, services, or the coordination of services among field offices
e. When internal concerns are expressed over issues with systems, communications, or infrastructure that made it difficult to carry out the mission
f. Following instances of multiple fatalities when no national or regional service assessment is planned
g. In situations where significant impacts occur to a local community

When a regional AAR involving multiple offices is conducted, it may be beneficial for the offices to conduct an individual debriefing prior to the regional debriefing. The local debriefing will allow for the coordination and prioritization of discussion topics in the regional debriefing.

4.4 Membership

The core members of the AAR are the individuals or offices that participated in the event. The hallmark of the debriefing process is the participants' self-critique and reflection in contrast to the independent review by outside experts that is the hallmark of a service assessment.

A facilitator should be appointed to organize and orchestrate the AAR. Ideally, this person should not have been involved in the event. Critical skills for the facilitator are the ability to manage time, bring all participants into the discussion, seek clarity on facts and statements, and manage emotions.

4.5 AAR Process

4.5.1 Debriefing Preparation

The facilitator should establish the date and time for the debriefing, reserve a conference call number and Web conferencing capability (if needed), invite the participants, and share any background information including debriefing ground rules and agenda.

4.5.1.1 Ground rules for the AAR Debriefing

The facilitator should maintain the following ground rules:

a. Keep the debriefing to two hours or less
b. Encourage participants to be respectful and provide criticisms in a positive, constructive manner
c. Get participants to provide specifics (e.g., who, what, when, where)
d. Serve as a moderator and let all participants know they should be willing to give and to receive constructive criticism in a non-confrontational manner
e. Assist the participants in identifying ***possible*** causes for a situation (e.g., plans, policy, procedures, staffing, training, equipment)
f. Endeavor to keep side discussions to a minimum (This applies even when participants are on mute. The facilitator may want to remind participants that if they are talking, they are not hearing what others are saying.)

g. Encourage every participant to speak up about their concerns
h. Strive to run the AAR efficiently and to move on to new topics after a particular point has been made

4.5.2 Conducting the Debriefing

The facilitator will orchestrate the debriefing discussion with the premise that individuals learn and remember more when they participate actively and make their own analyses rather than when they listen passively to someone else. While the facilitator is critical to the process, it is important that the facilitator guide the discussion rather than lead the discussion.

The debriefing goal is to identify best practices, lessons learned, and other specific suggestions to better prepare for future events. The debriefing should examine the decision-making processes and the rationale behind the actions taken in addition to the results. Detailed meteorological or hydrologic case studies should be conducted independently of the AAR.

A suggested template for the AAR agenda is provided in Appendix A.

The facilitator should guide the discussion through three basic questions:

a. What happened? (Briefly, as the participants are expected to largely know the event.)
b. What went well?
c. What can be improved?

Participants should review and consider the performance areas identified in Appendix B when providing their critique of the performance during the event. These performance areas can apply to both individuals and teams. Offices may wish to tailor the recommended expectations for a particular AAR to their local needs.

The facilitator should consider recording the debriefing. It is difficult to facilitate the debriefing and capture the entire discussion at the same time. All participants in a debriefing must be informed and consent to a recording.

4.5.3 AAR Documentation and Follow-through

The most critical aspect for a successful debriefing is completion of the critique that can be used to inform NWS management regarding their decisions for appropriate follow-through action. It may be beneficial to capture a summary of the debriefing discussion to provide the context and rationale for the critique. A template for the AAR summary format is provided in Appendix C.

The preliminary critique should be discussed with appropriate program leaders in the office or regional headquarters and refined, as necessary. Once agreed upon, the critique should be forwarded to appropriate senior leaders for consideration and follow-through.

Early in the information collection process, the AAR team should provide NWS senior leadership with a recommendation concerning whether a regional or national service assessment should be initiated.

4.5.4 Sharing Best Practices and Lessons Learned

One way to share the best practices and lessons learned is to distribute the completed AAR summary, if one is written. In some cases, the Office of Chief Operating Officer (OCOO) Performance and Evaluation Branch (PEB) at NWS Headquarters (NWSHQ) may wish to place the summary on the NWS Performance Management website.

Other options for sharing the best practices are through webinars, training, etc., where individual items can be covered in greater depth.

5 National Service Assessment

5.1 Criteria for Initiating a National Service Assessment

A national service assessment may be conducted if an event results in any of the following conditions:

a. Multiple fatalities
b. Numerous injuries requiring hospitalization
c. Significant impact on the economy of a large area or population
d. Extensive national public interest or media coverage
e. Unusual level of attention to NWS operations (performance of systems or adequacy of warnings, watches, and forecasts) by the media, emergency management community, or elected officials

5.2 Authority for Initiating a National Service Assessment

The executive sponsor, normally the Chief Operating Officer (COO), approves the initiation of national service assessments. Input is provided by PEB (COO11) in collaboration with the Regional Director(s) of the affected region(s) and NCEP.

Service assessments may have an Executive Sponsor at the National Oceanic and Atmospheric Administration (NOAA) level (e.g., for hazardous events with wide-ranging impacts affecting several NOAA line office functions). In these instances, NOAA senior leadership may request that the Assistant Administrator for Weather Services (AA) initiate a national service assessment.

5.3 Approval Memorandum for Initiating a National Service Assessment and Team Charter

Once the national service assessment team is formed, the OCOO PEB will prepare an Approval Memorandum for the Executive Sponsor (e.g., OCOO Director, NWS AA/Deputy Assistant Administrator for Weather Services [DAA], NOAA senior leadership) of the service assessment.

It will include a brief outline of the event, impact(s), justification for conducting the assessment, and the team charter. A sample Approval Memorandum and team charter are provided in Appendix D.

The national service assessment team charter includes:

a. **Purpose** – provides the generic mission of services assessment teams.
b. **Event Summary** – provides a description of the hazard.
c. **Expected Outcomes/Activities** – defines the recommended areas of investigation for the team.
d. **Scope of Authority / Limitations** – defines the team's decision-making capacity including length of data-gathering period, fiscal parameters, resource allocation, and any limitations. National service assessment teams operate as independent entities within the NWS and are normally given broad authority to accomplish the mission. This authority includes allowing teams to determine where to go and what to investigate and report. However, teams are bound by specific requirements as detailed in the charter.
e. **Time Frame** – provides a schedule for milestones during the assignment (e.g., beginning and ending dates of the team's assessment activities, date of the team leader briefing to NWS senior leadership).
f. **Communication Requirements** – defines the team's responsibilities to report progress, to account for expenses, and to brief NWS senior leadership.
g. **National Service Assessment Team Membership** – provides the names, positions, and work locations of the team members.
h. **Team Confidentiality and Pre Release of Information** – defines the guidelines for early release of information collected by the service assessment team.

The charter will be drafted by PEB in collaboration with the team leader, affected regions, and as appropriate, NOAA senior leadership. The Executive Sponsor's signature on the Approval Memorandum begins the assessment process.

5.4 National Service Assessment Team Composition

PEB will facilitate and provide input to the selection of team members. A consensus of the COO, the regional director(s) or their designees of the affected region(s), National Centers for Environmental Predictions (NCEP), NWSHQ, and, if applicable, NOAA senior leadership will form the teams. Team member selection should be a highly collaborative process to ensure subject matter experts with strong team building and leadership skills are identified. Once the leader is selected, he/she also will provide input on team membership.

National service assessment teams may be made up of the following people:

a. Federal officials/employees, including through a detail agreement with another Federal agency, are the primary candidates of team membership.
b. Elected officials of state, local (including territorial), tribal governments, or their designees. Such team members must be acting in official capacities and meet to

discuss management or implementation of Federal programs that share intergovernmental responsibilities or administration. Consultation with the NOAA Office of General Counsel is recommended prior to inclusion of members in this category.

c. Other individuals not belonging to categories *a* or *b* above may participate as consultants to, rather than members of, service assessment teams. These individuals cannot participate in service assessment team deliberations and do not have a vote or a veto in team conclusions. It is recommended that, prior to using consultants, the NOAA Office of General Counsel be consulted.

5.5 National Service Assessment Team Leader

The team leader is responsible for setting the schedule for team activities, assigning tasks, keeping the team focused, adhering to the charter, briefing NWS senior leadership and the Executive Sponsor, and coordinating activities with PEB.

The team leader is to remain objective and maintain the independence of the team. The team leader is responsible for writing of the report, including the assignment of writing tasks to team members. The team leader is encouraged to seek advice on team activities, his/her responsibilities, and the writing and content of the report (particularly from previous team leaders). The team leader should ensure report recommendations are coordinated (e.g., NWSI 10-102, *New or Enhanced Products and Services;* other project management programs; existing action items on which work is currently being performed from previous national and regional service assessments) to avoid duplication of efforts.

5.5.1 National Service Assessment Team Leadership Selection Criteria

A NWS national service assessment team may be led by a single team leader or co-team leaders. Team leaders may be selected from within NWS, NOAA, or from another government agency. However, both the leader and co-team leader cannot be from within the NWS. A team leader selected from NWS will be from outside the affected region(s). Team leaders are selected based on their demonstrated project management and leadership skills, and their impartiality with respect to the assessment's objectives. It is preferable that either the leader or co-team leader has served on a previous assessment team.

5.5.2 National Service Assessment Team Leadership Authority

The national service assessment team leader has the final authority on the content of the report and the release of information. Preliminary release of information outside the team will be limited to special situations. The decision regarding preliminary release should be made in consultation with the team members and coordinated with PEB, NOAA Office of Public and Constituent Affairs (PCA) (NWS), and appropriate regional directors. The team leader must consent to the preliminary release of any information. Distribution of the draft report within NWS is limited and must be carried out in accordance with the procedures detailed in this Instruction. While on assignment, and until the report is published, the grade and/or position of the team leader within the Government is not relevant to the chain of command because the team leader is invested with full authority to conduct the assessment by the Executive Sponsor.

5.6 Other National Service Assessment Team Members and Consultants

The national service assessment team will include the following members:

a. At least one subject matter expert from within the NWS for the type of event in question
b. At least one person from within the NWS who has experience in field operations
c. At least one person from outside the NWS, in accordance with Section 5.4a or b, who has expertise related to the event
d. A social science/behavioral science expert in accordance with Section 5.4a, or 5.4b.

It is preferable to include one or more of the following members:

a. A PSDA QRT member (if applicable)
b. An AAR team member (if applicable)

5.6.1 National Service Assessment Team Representation

The maximum number of NWS team members from affected regions should be:

a. Two people for one-region events
b. Three people for two-region events (two from one region and one from the other region)
c. Three people for three-region events (one from each region).

For unusual situations where a large team is needed, this requirement may be relaxed. National service assessment team members work under the authority of the team leader. They devote full time to the team while on site and then as needed until released by the team leader. Team members are expected to employ good team skills (including respect for differing opinions), to ensure all members have an opportunity to be heard, to adhere to mission requirements and the team charter, and to maintain confidentiality. Team members are expected to treat all information collected by the service assessment team, report drafts, briefings, and discussions, as internal and confidential until the final report is released publicly. Following release of the final report, the release of any related supporting documents will continue to be subject to applicable Federal information law, including the Freedom of Information Act (FOIA).

6 National Service Assessment Process

The national service assessment process begins once the Approval Memorandum has been signed or verbal approval granted by the Executive Sponsor. The actual start usually occurs when recovery efforts are sufficiently advanced to allow team members safe access to the affected area and when emergency management, local officials, NWS personnel, and the media have time to interact with team members. Final determination on when to begin the assessment process is made by the team leader with advice from the NWS region(s) and PEB.

The national service assessment process should be completed within 180 days. It is preferable that this period includes the time from team activation to report publication, but it may be measured from team deployment, particularly when there is a delay. See Appendix E for a flow chart of the timeline and process.

6.1 Pre-Service Assessment Activities

All national service assessment team members should read the AAR for the event (if one was prepared), appropriate directives, instructions, service assessment team training slides, action items from previous service assessments, and other applicable documents and take the National Service Assessment Team Training module no later than the start of field work. The PEB will either provide these materials or the locations where the team members can access them.

Root Cause Analysis (RCA) training is highly recommended and available to all service assessment team members prior to on-site service assessment activities to ensure appropriate critical thinking techniques are integrated into the service assessment process. This training is short, focused, and led by the Office of Chief Learning Officer in multiple sessions, as necessary to accommodate team member schedules.

As needed, PEB should provide a facilitator to assist in training and briefing the team on the assessment process. Facilitator assistance should be accomplished through teleconference or other remote methods.

6.1.1 Itinerary

The national service assessment team leader will work with affected region(s) and local NWS offices to develop the travel itinerary and then coordinate with PEB. Travel arrangements should be made by each team member through local administrative support personnel and will be reviewed and approved by the OCOO and the AFSO budget office. OCOO will pay the travel expenses associated with the team and AFSO will provide the related accounting codes.

6.1.2 Logistics

NWSHQ or regional HQ administrative assistant support and, when appropriate and available, NOAA PCA (NWS) can assist the affected local offices in making service assessment team interview appointments with members of the media. OCOO (with assistance from affected regions) will ensure team members have the necessary equipment to accomplish the mission (e.g., voice recorders, laptops). OCOO will also provide additional supplies as needed (e.g., copies of previous service assessments reports, pertinent documents).

6.1.3 Initial Meeting

The team leader should convene a meeting for the following purposes:

a. To outline objectives and work procedures
b. To assign tasks
c. To create sub-teams, as necessary
d. To assess the need for an initial press conference and establish media strategies
e. To establish a work schedule

6.1.4 Affected NWS Offices or Centers

NWS Offices or Centers should coordinate with the team leader or the team leaders' designee:

a. To make copies (electronic versions whenever possible) of all relevant public products, forecast discussions, and logs
b. To arrange interviews with local emergency management officials, media, elected officials, and cooperating agencies
c. To recommend suitable hotel accommodations
d. To arrange for meeting space

Except for data normally disseminated to the public, NWS Offices or Centers will not publicly release information collected as part of the service assessment (e.g., probable maximum wind speeds, rainfall analysis, or quality/accuracy of NWS services) without the express consent of the team leader. In the case of tornadoes, see NWSI 10-1604, *Post-Storm Data Acquisition*, for instructions on the release of preliminary information.

6.2 On-site Assessment Activities

Team members will gather information as assigned and report daily findings to the team leader. The team leader will conduct meetings as necessary:

a. To assess progress
b. To modify or develop new assignments for the next day
c. To coordinate with PEB
d. To identify information, if any, to be released

It is preferable to begin writing the assessment report, or at least create an outline, before the team is released. However, the final decision rests with the team leader.

6.3 Post-Assessment Activities

Team members may have responsibilities until the public release of the final report. They may be asked to write, rewrite, and/or review various sections of the report; assist in developing appropriate briefing materials; and/or conduct briefings.

6.4 Draft Report

The team leader should provide a draft report to PEB within 70 days of team activation. The draft report should adhere as closely as possible to the format and content described in Appendix F. However, the team leader has the authority to depart from these requirements after consultation with PEB.

Statements made in the following sections notwithstanding, no changes will be made to the report without the express consent of the team leader.

The review process should proceed as follows:

Step 1. The draft report is reviewed and edited by PEB and its designees for content, technical accuracy, format and grammar, and other issues as needed. This is an iterative process that will be accomplished in close collaboration with the team leader.

Step 2. The draft report is sent for review to the affected regions, NCEP, Weather Forecast Offices (WFO)/River Forecast Centers (RFC)/Center Weather Service Units (CWSU), and other subject-matter experts, as appropriate. The comments resulting from these reviews will be provided to the team leader for adjudication.

Step 3. Draft findings and recommendations are sent to the Mission Delivery Council (MDC), Chief Learning Officer, and other NWS Leadership for early identification of potential operational impacts, system impacts, or training issues. Anyone receiving the draft report for review should keep these draft findings and recommendations confidential. Comments will be forwarded to the team leader and PEB for consideration. All changes to the report will be under the sole authority of the team leader. The team leader and/or PEB will make a good faith attempt to inform those submitting comments as to their disposition.

Step 4. PEB will forward the draft report to the OCOO for review, editing, policy compliance, and awareness (continuity of operations). The draft report will be returned to the team leader for the adjudication of the review comments.

Step 5. The team leader, or co-leaders, and other team representatives with specialized expertise will brief the MDC in person at NWSHQ or via a video teleconference. Prior to the briefing, the draft report and briefing slides will be provided to the attendees. Normally, the briefing should present an overview of the event and its impact, provide highlights of best practices, and identify areas of needed service or program improvement (i.e., findings and recommendations). The findings and recommendations will be presented with a justification for inclusion in the report.

Attendance may be in person at the briefing or remote and should include the following representatives:

a. MDC members
b. NOAA senior leadership or their designee(s)
c. NOAA Office of Legislative Affairs (OLA) (NWS)

d. NOAA General Counsel (GC) Weather, Satellites, and Research Section
e. NOAA PCA (NWS)
f. Affected MIC(s)/HIC(s) at the discretion of the regional director(s)
g. NWS Employees Organization (NWSEO) representative
h. Others (as determined by AA or COO)

Step 6. After the briefing, attendees will have one week (five [5] business days) to submit final comments to PEB. The team leader, with support from PEB, will determine if any report changes are needed.

Step 7. NOAA GC Weather, Satellites, and Research Section; Legislative Affairs; and Public Affairs will review the report and recommend changes. PEB and the team leader will make appropriate report modifications.

Step 8. The Executive Sponsor will sign the report signifying the end of the report review period and readiness of the report for public release. Signature also indicates that NWS will thoroughly consider implementing the team's recommendations as they are written; however, it is recognized that the agency may implement alternative solutions to resolve the findings and to meet the intent of the service assessment team's recommendations. Alternative solutions may be implemented because they are, for example, deemed more effective, more rapidly deployed, or less costly.

6.4.1 Prerelease of Report Information

The prerelease of report information to NWS and NOAA senior leadership and the prompt implementation of recommendations are considered to be in the public's best interest.

a. Team leaders, in consultation with PEB, are strongly encouraged to initiate contact with appropriate office(s) before the report is officially released. This includes both operational (e.g., WFOs/RFCs, regional offices) and programmatic (e.g., training, awareness) entities. Contact can occur at any time during the service assessment process. In no instance, will there be prerelease of information without the express consent of team leader. Confidentiality requirements will be followed.
b. Team leaders will share critical report information with the Executive Sponsor as soon as practical after drafted by the team to inform leadership about any time-sensitive issues—especially those that could be quickly addressed.

6.4.2 Dissemination of the National Service Assessment Final Report

Prior to, or in conjunction with, the release of the final report, NOAA PCA (NWS), NOAA OLA (NWS), OCOO, and the team leader, will collaborate on what, if any, briefings are required. Briefings normally will be held when findings reveal significant issues or problems.

a. NOAA OLA (NWS) will work with the team leader, OCOO, and the appropriate region(s) to arrange briefings for appropriate members of Congress. If a briefing is not necessary, an announcement of the report release and a contact for additional information will be sent to appropriate members of Congress. Normally, the briefing will be held, or the announcement sent, the day before release of the report to the public. Activities involved with briefings and/or announcements are the responsibility of NOAA OLA (NWS).

b. NOAA PCA (NWS) will work with the team leader, OCOO, and the appropriate NWS region(s) to determine the public interest (newsworthiness) and subsequently develop a rollout strategy. If a media briefing is not necessary, appropriate press release(s) or simply an announcement message may be issued. It is recommended that MICs and Warning Coordination Meteorologists (WCM) from the affected offices share the announcement message with their local media.
c. PEB and/or NOAA PCA (NWS) will compose the announcement message to indicate the public release and posting location of the service assessment.
d. At least five (5) days before publicly releasing of the service assessment report, the final draft document will be widely distributed internally to all NWS regions, NWSHQ offices, NCEP, and affected NOAA offices. This is the responsibility of PEB. The report will be labeled on each page with the title "**DRAFT - FOIA Exempt - Not for Public Release.**" The document will become final at the time of its release. There will be no external distribution before the release date and time.
e. NWS Communications Division should post either information from the PCA Press Release or the announcement message on *NWSNews* and social media sites, as appropriate.

On the official release date, the report will be made available on the NWS, OCOO, regional office(s), and local office(s) Internet home pages, as appropriate. Printed reports will be distributed internally to: AA, DAA, NOAA PCA (NWS), COO, regional and NCEP directors, all service assessment team members, affected offices, and, when appropriate, NOAA senior leadership. Upon request, a reasonable number of additional hard copies may be created and made available by PEB. OCOO will be responsible for funding and printing of service assessment reports and costs connected with media, Congressional, and/or NOAA briefings.

7 Regional Service Assessments

Events for which a national service assessment is not undertaken may result in a regional assessment, which may be conducted at lower impact thresholds (see Section 5.1). The decision to conduct a regional service assessment is under the authority of the affected region(s) with input, if requested, from AFSO, NCEP, the Office of Water Prediction (OWP), in coordination with PEB. Team membership is determined regionally.

7.1 Regional Headquarters Responsibilities for Regional Service Assessments

a. Submit a draft report to PEB within two months (60 days) of team activation.
b. Update the draft report based on all feedback.
c. Notify MDC and other applicable senior leaders of any significant issues and key findings in the report.
d. Ensure final report is completed and signed by regional director within four (4) months (120 days) of team activation.

e. Recommend MICs and WCMs from the affected offices share the announcement message (see Section 7.2f below) with their local media.
f. Identify the scope of findings and recommendations (i.e., NWS regional, NWS multi-regional, national) in collaboration with PEB.
g. Track recommendations that have been identified as local and regional in scope.

7.2 National Headquarters Responsibilities for Regional Service Assessments

Once the draft report is received by NWSHQ, PEB will facilitate the clearance and release processes:

a. Applicable NWSHQ offices (e.g., OCOO; AFSO; Office of Observation; Science, Technology and Integration Office; Office of Chief Learning Officer) and NCEP will concurrently review content, validate national recommendations, and ensure compliance with this directive, *NWSI 10-1606, Service Assessment*. All review comments should be provided to the regional assessment team within two (2) weeks.
b. After comments have been incorporated, NOAA Office of General Counsel will review the regional service assessment draft report for potential legal implications.
c. NOAA Office of Legislative Affairs (OLA) (NWS) will review draft report for potential constituent concerns.
d. NOAA PCA (NWS) will review draft report for media concerns.
e. OCOO will review and edit for policy compliance and awareness (continuity of operations).
f. NOAA PCA (NWS), in coordination with OCOO and the submitting regional director, will determine the public interest (newsworthiness) and subsequently develop a rollout strategy. If a media briefing is not necessary, an appropriate press release, or simply an announcement message may be issued. PEB and/or NOAA PCA (NWS) will compose the announcement message to indicate the public release and posting location of the regional service assessment.
g. NWS Communications Division should post information from the PCA press release or the announcement message on *NWSNews* and social media sites, as appropriate.
h. PEB will track recommendations that have been identified as national in scope.

8 Assignment and Implementation of National and Regional Service Assessment Recommendations

8.1 Formulation of Action Items from Recommendations

All service assessment recommendations will be vetted through the MDC. The MDC will help identify which of these national service assessment recommendations—and regional service assessment recommendations with a national scope—will become new requirements. The MDC may decide not to convert some of the recommendations to new requirements for well-defined, valid reasons (e.g., lack of resources, overcome by events). In addition, the MDC will help determine the responsible point of contact in each office and the expected closeout date for each action item created. As directed by the MDC, the service areas and/or PEB will submit new requirements, as appropriate, into the Capabilities and Requirements Decision Support (CaRDS) process for vetting and validation.

8.2 Action Item Tracking

Once action items are assigned, their status will be tracked using the PEB Service Assessment Tracking System (SATS) program. SATS will provide PEB and NWS leadership with both detailed and high-level reports on all action items, as required. Action items are considered open and remain in SATS until implemented, or otherwise closed for valid reasons (e.g., lack of resources, overcome by events, or senior leadership decision).

NCEP, regional headquarters, WFOs, RFCs, and CWSUs, are encouraged to maintain data from all service assessment report recommendations and best practices that apply to their respective areas of responsibility. These should be used for service improvement, training, etc.

PEB should maintain similar data that include all recommendations and best practices. These data should be used to determine if recommendations are repeated, why they are repeated, and to avoid repetition in future service assessment reports.

Appendix A AAR Interview Agenda Template

AGENDA

What happened?

- *Let's consider the entire event from the initial outlook through support to recovery efforts (state, local)*
- *Significant events and decision points in timeline*

What went well?

- *Start with the positives!*
- *Pick several things that you thought went well*

What can we improve?

- *Identify those things that you thought could be improved*
- *Address key areas such as communications, resource management, equipment, meteorological knowledge, and "knobology"*

Appendix B Performance Area and Factors

Performance Area	Performance Factors
PRODUCT DELIVERY	Coordinates development of products with appropriate team members and external organizations to ensure timely completion and consistency Delivers quality products on time with few errors
COMMUNICATIONS AND BRIEFINGS	Uses proper displays and visual aids to communicate effectively Focuses on Decision Support Services and Customer Impacts Tailors information to needs of different customers Clearly and succinctly explains forecast rationale
METEOROLOGICAL REASONING AND JUDGMENT	Uses appropriate data and conceptual models to analyze existing conditions (diagnosis) Uses appropriate data and conceptual models to make predictions (prognosis) Implements steps or strategies to mitigate data limitations affecting forecast
SITUATIONAL AWARENESS AND MISSION COGNIZANCE	Maintains individual and team situational awareness Monitors appropriate communications channels (12Planet, NWSChat) and Situational Awareness Displays Responds effectively to unexpected events
SYSTEMS KNOWLEDGE AND SKILL	Demonstrates a good working knowledge of directives, procedures, and tools Applies meteorological/hydrological systems knowledge to support operations
PROBLEM RECOGNITION AND RESOLUTION	Identifies the existence of a problem Executes timely responses to problems Assesses impacts of problems to operations Notifies team and appropriate headquarters or customers of problems
TEAMWORK	Plans, prioritizes and coordinates among: team, and other outside organizations Ensures roles and responsibilities are defined and understood Performs effectively as a team member Utilizes team expertise effectively
ATTITUDE AND EFFORT	Accepts responsibility for personal decisions and actions Provides inputs in a positive, calm, and constructive manner Encourages maximum effort from others through personal words and actions
SYSTEMS AND INFRASTRUCTURE	Documented issues with systems, communication networks, and other infrastructure that impaired or inhibited service delivery and mission execution

Appendix C AAR Summary Format Template

After-Action Review (AAR)
Event Name:
Event Date(s):

LIMIT TO NWS ONLY: DO NOT REDISTRIBUTE
FOIA EXEMPT - NOT FOR PUBLIC RELEASE

This is a rapid evaluation of service activities and performance

Debriefing
(*Conducted <date>*)

<u>INTERVIEW AGENDA</u>

What happened?

- *Let's consider the entire event from the initial outlook through support to recovery efforts (state, local)*
- *Significant events and decision points in timeline*

What went well?

- *Start with the positives!*
- *Pick several things that you thought went well*

What can we improve?

- *Identify those things that you thought could be improved*
- *Address key areas such as communications, resource management, equipment, meteorological knowledge, and "knobology"*

Some potential discussion points for this particular event

- *Were there concerns identified by partners or NWS personnel that helped to trigger the AAR?*

<u>SUMMARY REPORT</u>

- **Brief Event Summary**
- **Best Practices/Things That Went Well**
- **Things That Can Be Improved**
- **Things of Note**
- **Debriefing Facilitator**
  Name, Affiliation
- **Debriefing Participants**
  WFO XYZ - Name
  WFO XYZ - Name
  XYRFC - Name
  RH(s) -

Appendix D Sample Approval Memo and Team Charter

MEMORANDUM FOR: John D. Murphy
Chief Operating Officer (COO), NWS

FROM: Cindy P. Woods
Chief, NWS Operations Division

SUBJECT: Service Assessment Team for the January 2016 Blizzard

A Service Assessment (SA) team has been formed to assess the National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) performance before and during the blizzard event that occurred across the Middle Atlantic and Northeast United States, from January 22–24, 2016.

The Eastern Region (ER) Director and National Centers for Environmental Prediction (NCEP) Director concur on the attached charter. The charter focuses the SA Team's work and establishes the resources, scope, and timeline for the service assessment. If you agree with the contents of the charter, the team will be activated.

Attachment

Approve:

______________________________ __________
John D. Murphy, COO Date

NOAA-NWS Operations and Services Team Charter for the Historic Blizzard of January 22–24, 2016

<u>Purpose</u>: NOAA's NWS mission is focused on providing weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy. This SA team is charged with documenting and evaluating the effectiveness of NWS service delivery (services and operational procedures) as related to the blizzard and significant coastal flooding that occurred across portions of the Middle Atlantic and Northeast from January 22–24, 2016. In addition, even though it was a separate event, the SA team is also charged with documenting and evaluating the decision support and messaging for the Wednesday, January 20, 2016 event. This event of approximately 1" of snow was well forecast but paralyzed the Washington D.C. region.

<u>Event Summary</u>: A major winter storm produced 18–36 inches of snow over a wide area of the eastern United States, from West Virginia to southeastern New York. Baltimore-Washington International Thurgood Marshall Airport set a new record storm total snowfall of 29.2 inches. Washington-Dulles International Airport (28.3 inches) and New York Central Park (26.8 inches) recorded their second highest storm total snowfall in recorded history. The storm produced wind gusts exceeding 60 mph at numerous locations along the Atlantic Coast in Massachusetts, New Jersey, Delaware, and Virginia. The peak gust reported was 85 mph in Assateague, Virginia. Major coastal flooding occurred in southern New Jersey and Delaware. Preliminary data show that Cape May, New Jersey, experienced a storm surge of 3.9 feet and a total water level of 9.0 feet. This exceeded the record of 8.9 feet during Hurricane Sandy in October 2012.

<u>Expected Outcomes/Activities</u>: After Action Reviews (AAR) have been conducted by ER Headquarters, Southern Region (SR) Headquarters, Central Region (CR) Headquarters between their affected field offices and Weather Prediction Center (WPC). NCEP also conducted a holistic AAR that included eight of its nine National Centers. These AARs can be used as a base of information for the SA team to focus their investigative work. The SA team will be responsible for examining and incorporating applicable information from one or more of the AARs into the service assessment report.

In particular, this SA team should evaluate the generation and provision of operational products and services, identify best-case operations, procedures, and practices, and make recommendations to address any service deficiencies. The recommended areas of investigation are as follows:

1. **Decision Support Services and Messaging.** Examine the provision of decision support services to local, state, and regional partners before, during, and after the hydrometeorological event.

    a. How effective was the NWS in communicating uncertainty of the forecast track for the northern fringes of the blizzard to the public, local officials, and the media?

    b. Investigate the Wednesday, January 20, 2016 event of approximately 1 inch of snow that was well forecast but paralyzed the Washington D.C. region. Did messaging of the impending blizzard overshadow what should have been a nuisance snow?

2. **NWS Forecasts, Products, Warnings, and Services.** Assess the effectiveness of the internal NWS communication/coordination among the affected Weather Forecast Offices (WFO) and WPC. What best practices and lessons were learned? Assess the quality and effectiveness (i.e., timeliness, accuracy, specificity, message clarity, consistency) of NWS forecasts, warnings, and decision support services concerning the blizzard, including coastal flooding. Was the ER Regional Operations Center used effectively?

3. **Snowfall Observations.** Investigate the controversy surrounding the snowfall measurements at Reagan National Airport. Were snowfall measurements properly taken according to the established NWS guidelines? Are existing guidelines for measuring snow adequate? Are sightings at the Local Climatological Data locations from Washington, D.C. to New York City, NY representative of their surrounding areas? This team is responsible for collaborating with the short-duration Integrated Work Team investigating this issue and incorporating into this assessment a section on this topic including any findings and recommendations.

4. **Computer Models**. How did models/ensembles perform, especially for the northern fringes of the forecasted heavy snow? Investigate potential causes for model performance deficiencies or predictability challenges particularly concerning the forecast gradient for snow in the New York and southern New England areas. This team is responsible for collaborating with NCEP and incorporating into the assessment a computer model performance section created by an NCEP subject-matter expert.

Scope of Authority/Limitations: The SA team should interact with impacted stakeholders, including, but not limited to, emergency managers and those directly involved in heavy snowfall and coastal flood operations along with civil authorities, transportation officials, and the media. Additional information can be obtained from others as deemed necessary by the team. The following NWS entities are to be evaluated by the team either through face-to-face visits or teleconferences as deemed appropriate by the SA team:

a. WFO Mount Holly, PA, WFO Upton, NY, and WFO Sterling, VA (and any neighboring WFOs as necessary)
b. NCEP's Environmental Modeling Center (EMC) and WPC
c. ER Headquarters and ER Regional Operations Center
d. NWS Operations Center

The team has the authority to:

- Obtain and use all products, logs, etc., produced by offices significantly impacted (e.g., WFOs, NCEP, ER Headquarters).
- Interview any employees in the NWS it deems necessary to accomplish its mission.
- Make recommendations for improving NWS services and operations.
- The SA team should employ the most efficient method for gathering information (e.g., telephone interviews, video teleconferencing, travel, etc.). NWS employee travel authorizations should be generated by the local office supporting the traveler. The front page should be emailed to the Performance and Evaluation Branch Chief (douglas.young@noaa.gov) as soon as practical for coordination and approval in Office of Chief Operating Officer (OCOO) and AFSO. All other travel authorizations will be prepared by OCOO.
- Total expenses are **not to exceed $20,000**.

<u>Time Frame</u>: SA Team activities should be prioritized based upon the issues that most significantly and directly influenced NWS performance during the event. The preliminary schedule is as follows:

- Conduct initial team meeting: ***Sunday evening, February 28, 2016 2016.***
- Begin first week of on-site assessment activities (e.g., office visits): ***Monday, February 29, 2016.***
- End on-site, assessment activities: Team debrief, writing assignments, etc., and travel home: ***On or about Friday, March 4, 2016.***
- Send draft report to OCOO Performance and Evaluation Branch: ***No later than Monday, May 2, 2016.***
- Team leader briefs NWS leadership: ***On or about Tuesday, June 28, 2016.***

<u>Communication Requirements</u>:

- SA Team leader should report progress of the team in weekly messages to the COO, ER Director, Operations Division Chief, and the Performance and Evaluation Branch Chief. This report should contain travel itineraries, a list of people interviewed, and a brief description of important findings, recommendations, and/or issues.
- SA Team leader should keep the Performance and Evaluation Branch Chief informed of money spent, as well as spending plans.

- SA Team leader should conduct meetings to assess the team's progress, modify or develop new assignments for the day, and address issues regarding the release of information.
- SA Team leader will provide a briefing on the team's findings and recommendations to NWS leadership.

Members: SA Team members have been selected based upon their expertise, experience, and potential for contributing significantly to a constructive and thorough service assessment. The SA Team will include the following members:

1. **Thomas Johnstone**, Team Lead, MIC, WFO Corpus Christi, TX
2. **Kevin Barjenbruch**, WCM, WFO Salt Lake City, UT
3. **Alan Gerard,** WRDD Deputy Division Chief, NSSL, Norman, OK
4. **Bruce Smith**, MIC, WFO North Central Lower Michigan, MI
5. **Andy Nash, MIC**, WFO Burlington, VT
6. **Cedar League**, Social Scientist, Helena, MT

SA Team Consultants: The SA Team should make use of consultants to answer questions regarding policy, technological capabilities (e.g., software, communications, dissemination), societal response, training options, or other issues as they arise. Although named in this charter, consultants are not members of the SA Team. The following may be consulted at any point while the service assessment team is active:

1. **Paul Pisano**, Federal Highway Administration, US DOT, Washington, DC
2. **Susan Buchanan**, Public Affairs Specialist, USEC/PCA, Silver Spring, MD
3. **Rebecca Noe,** Epidemiologist, CDC, Atlanta, GA
4. **Geoff Manikin**, Meteorologist, Mesoscale Modeling Branch, EMC, College Park, MD
5. **Vankita Brown**, Social Scientist, NWS Headquarters, Silver Spring, MD

The SA Team leader is responsible for engaging the collaboration that will lead to the success of the team. The role of the team leader includes the following:

- Keeping the purpose, goals, and approach of the team relevant and meaningful
- Building commitment and confidence in team members
- Utilizing the skills and expertise within the team through task delegation and cooperation
- Managing feedback from outside of the team and soliciting advice/input from outside of the team when needed
- Working closely with the National Service Assessment Program Leader to ensure the process is efficient and the results are timely and effective

All members of the SA Team can provide leadership in the achievement of the SA team objectives and should assume personal accountability for the success of the team. The role of each team member includes the following:

- Communicating with the team in an open and courteous manner
- Providing support, suggestion, opinion, and information toward the objectives of the team
- Encouraging creativity and innovation among fellow team members

Team Confidentiality and Pre Release of Information:

- Information collected by the SA Team, report drafts, briefings and discussions, are internal and confidential until the final report is publicly released. In no instance will there be prerelease of information without the express consent of the team leader. All employees with access to these data are also expected to maintain confidentiality.

The SA Team Leader, in consultation with the Performance and Evaluation Branch, is strongly encouraged to initiate contact with appropriate office(s) before the report is officially released. This includes both operational (e.g., WFOs, regional offices) and programmatic (e.g., training, awareness) entities. Contact can occur at any time during the SA process.

Appendix E Service Assessment Timeline

The timeline is guidance and may vary based on individual assessment characteristics. The 180-calendar day deadline is fixed.

Assessment Timeline (calendar days)	Activity
Day 1 – 10 (10 days)	• Team activation • On-site assessment and data gathering
Day 11 – 70 (60 days)	• Team develops draft report • Team delivers draft report to PEB
Day 71 – 91 (20 days)	• PEB and Team edit and format report
Day 92 – 108 (16 days)	• Affected entities and subject matter experts review and comment on report
Day 109 – 121 (12 days)	• Team responds to comments • PEB and Team incorporate changes
Day 122 – 130 (8 days)	• OCOO review and clearance to make MDC briefing
Day 131 – 143 (12 days)	• Concurrently, Team responds to OCOO review comments, prepares briefing for MDC, and sends draft briefing slides to PEB. • PEB reviews briefing slides • PEB sends briefing slides and draft report to MDC and other attendees
Day 144 (1 day)	• Team leader(s) briefing to MDC and other attendees
Day 145 – 152 (7 days)	• MDC briefing invitees provide follow-up comments on report (5 business days) • PEB and Team incorporate changes
Day 153 – 163 (10 days)	• General Counsel, Legislative Affairs, and Public Affairs review report • PEB and Team incorporate changes
Day 164 – 170 (6 days)	• Executive Sponsor approves via signature
Day 171 – 177 (6 days)	• PEB makes report available for internal distribution (5 business days)
Day 178 – 180 (2 days)	• Posting, briefings, and press release

Appendix F Service Assessment Report Format

The report will be written by the assessment team leader who will determine the amount of written input to be received from team members. The team leader may request help from PEB, if needed. Below are guidelines for report format; however, each assessment is unique and the format may be adapted, if necessary.

The service assessment report is a comprehensive, formal document that contains information concerning:

a. The nature, intensity, and impact of the event.

b. The performance of affected NWS offices prior to and during the event, focusing on the full range of products and services. Post event activities, if pertinent, may be included. OCOO will provide guidance as to which offices are to be included in the report but final determination is made by the team leader, unless specified in the Charter. Performance includes accuracy and quality of warnings, forecasts, and other products and such things as responsiveness to requests for data and briefings.

c. The response to NWS warnings and forecasts by those affected by the event. Examples are partner/user groups including emergency managers, media, local / state / national officials, and the general public.

The report will contain information with supporting evidence. It should be written in a readable style. While technical language is sometimes needed, explanations should be provided. Excessive detail is discouraged and the report should be as short as possible, while still telling the whole story.

Graphs, tables, and photographs should be included, but limited to those that complement the story and/or demonstrate the event's impact. Editorial comments (opinions) should be avoided. Be wary of making subjective blanket statements of high performance/success, especially when there are more than a few recommendations for improvement. When recognition is appropriate, the report should include praise for specific people, offices, or actions. However, identification of performance deficiencies should remain at or above the office level and not be attributed to specific individuals or position titles.

Draft materials for service assessments are pre-decisional documents. All draft materials will be marked "FOIA Exempt - Not for Public Release." In addition, every page of all draft documents will include a prominently visible label of "Draft."

Final National Service Assessment Reports can be viewed at:
http://www.nws.noaa.gov/om/assessments/index.shtml

Service assessment reports will contain (at a minimum) the following sections:

a. **Cover -** contains a picture associated with the event.

b. **Title Page**.

c. **Preface**. The Preface should include any pertinent background scope and intent. It should be brief, well under a page and give the reader a sense of why the report should be read. The Preface is signed by the AA.

d. **Table of Contents**.

e. **List of Team Members.** Members of the assessment team, their titles, and home office or company. Other valuable contributors to the document.

f. **Acknowledgements**. If necessary, this section should list acknowledgements that are not included in the "Other valuable contributors" section above.

g. **Executive Summary.** The Executive Summary is a brief, non-technical version of the report primarily for those who do not intend to read the entire document. Only the most important details of the event and its impacts, NWS activities, and user responses should be included. This section should contain a summary of the recommendations and/or one or two of the most pertinent recommendations.

h. **Report Body.** An introduction should be the first section of the report body and include the NWS mission, purpose of the report, and methodology. The team has leeway to arrange the remaining sections of the report to best tell the story. The report body may include an event overview, hydrometeorological summary, office and center activities, observations, systems, communications, coordination, continuity of operations, outreach and preparedness, statistical and model guidance, training, management, or any other applicable sections. A status should be included of fully operational, partly operational, or non- operational at each event bulletin update for all Mission Critical systems.

i. **Facts, Findings, and Recommendations.** Facts, findings, and recommendations should be spread throughout the body of the report.

A **fact** is a discussion which flows from earlier narrative, usually immediately before the fact, that highlights and complements something important learned from the assessment and does not necessarily lead to a finding. A fact often reiterates significant ideas/points of previous narrative. Facts are not numbered and do not necessarily lead to findings. An example of a fact is: "**Fact:** During the event, WFO Cleveland issued 24 severe thunderstorm warnings, with an average lead time of 22 minutes."

A **finding** is a statement that describes something important learned from the assessment. Findings are numbered in ascending order. They should be clear and concise with no opinions, repetition, or unrelated information and lead directly to a recommendation. Findings preferably should only lead to one associated recommendation.

An example of a finding is: "**Finding 1**: The team discovered many users of WFO XYZ and WFO ABC Internet sites had trouble locating specific information because the sites were arranged in different formats."

A **recommendation** is a specific course of action, directly related to a finding that will lead to improved NWS operations and/or services. Each recommendation is numbered with the same number as the associated finding. Recommendations should be written in terse, declarative sentences and be practical, specific, achievable, trackable, and closeable within a reasonable amount of time. Avoid statements such as "WFO River City should continue to work with emergency managers to publicize the value of NWSChat" since the time frame (i.e., should continue) is too vague. Limit the use of adjectives (most, few) and adverbs (generally, usually). **Recommendations should address problems beyond the scope of any individual office.** Problems affecting one or two offices can usually be addressed at the regional level. Also, if the problem has already been included in a previous service assessment as a recommendation, it should not be a recommendation again; instead, it could just be mentioned in the document text.

An example of a recommendation is "**Recommendation 1:** WFOs should arrange to provide storm spotter training classes for each of their counties at least every other year."

Team opinions should be identified as such and may be included in the report's body. Opinions should not be included in best practices, facts, findings, and recommendations.

Additionally, reports should include an appendix listing all findings, recommendations, and best practices. A separate listing of facts (other than in the body of the report) is not required.

j. **Best Practice**. Innovative, successful actions taken to accomplish the NWS mission that are worthy of use and can be used in other parts of the agency. At the discretion of the team leader, these may be grouped or spread through the body of the report, whichever enhances reader comprehension. Best practices should contain factual information and not opinions. They are not numbered.

k. **Appendices.** Included here should be information of interest, but not essential to the report story line. Examples include a list of acronyms and what they represent; definitions; findings, recommendations, and best practices; event statistics; records; references; and event timelines.